EXHIBIT B

System R: Relational Approach to Database Management

M. M. ASTRAHAN, M. W. BLASGEN, D. D. CHAMBERLIN,
K. P. ESWARAN, J. N. GRAY, P. P. GRIFFITHS,
W. F. KING, R. A. LORIE, P. R. McJONES, J. W. MEHL,
G. R. PUTZOLU, I. L. TRAIGER, B. W. WADE, AND V. WATSON

IBM Research Laboratory

System R is a database management system which provides a high level relational data interface. The system provides a high level of data independence by isolating the end user as much as possible from underlying storage structures. The system permits definition of a variety of relational views on common underlying data. Data control features are provided, including authorization, integrity assertions, triggered transactions, a logging and recovery subsystem, and facilities for maintaining data consistency in a shared-update environment.

This paper contains a description of the overall architecture and design of the system. At the present time the system is being implemented and the design evaluated. We emphasize that System R is a vehicle for research in database architecture, and is not planned as a product.

Key Words and Phrases: database, relational model, nonprocedural language, authorization, locking, recovery, data structures, index structures
CR categories: 3.74, 4.22, 4.33, 4.35

1. INTRODUCTION

The relational model of data was introduced by Codd [7] in 1970 as an approach toward providing solutions to various problems in database management. In particular, Codd addressed the problems of providing a data model or view which is divorced from various implementation considerations (the data independence problem) and also the problem of providing the database user with a very high level, nonprocedural data sublanguage for accessing data.

To a large extent, the acceptance and value of the relational approach hinges on the demonstration that a system can be built which can be used in a real environment to solve real problems and has performance at least comparable to today's existing systems. The purpose of this paper is to describe the overall architecture and design aspects of an experimental prototype database management system called System R, which is currently being implemented and evaluated at the IBM San Jose Research Laboratory. At the time of this writing, the design has been